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ABSTRACT

Some possible solutions to the shortage of faculty jobs are addressed in two papers. In "PhDs in Nonacademic Careers: Are There Good Jobs," Lewis C. Solmon evaluates the prospects for nonacademic jobs for humanists, scientists, engineers, and social scientists, based on three separate studies. Projections on the probable major of undergraduates are examined to indicate the demand for faculty by subject field. Information is provided on the number of PhDs produced each year in selected humanities fields; employment of PhDs by field, type of employer, and primary work activity; and overall job satisfaction by employment sector and field of PhD. Recommendations are offered for current graduate students. In "Robots or Reinsmen: Job Opportunities and Professional Standing for Collegiate Administrators in the 1980s," Robert A. Scott suggests that one probable growth area resulting from faculty job shortages is in mid-level administrator jobs. New types of administrator roles are described that will likely be created in response to increasingly powerful external agencies. Young faculty who fail to gain tenure and older faculty who lack students because of lower enrollment are probable new sources of middle-level administrators. The more experienced mid-level managers, seeing dwindling rewards and incentives in academe, may in turn be attracted to middle-management jobs in private industry and government. (SW)

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(7) PhDs IN NONACADEMIC CAREERS:
ARE THERE GOOD JOBS?

Lewis C. Solmon

ROBOTS OR REINSMEN: JOB OPPORTUNITIES AND PROFESSIONAL STANDING FOR COLLEGIATE ADMINISTRATORS IN THE 1980s

Robert A. Scott

American Association for Higher Education

The American Association for Higher Education

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The theme of the 1979 National Conference was "The Academic Workforce: Opportunities for Renewal." Some of the papers prepared for presentation at the conference were selected by a review committee for publication in the annual conference series, *Current Issues in Higher Education*. Many of the papers in this series focus on the quality of worklife in academe and ways to improve it. In some cases, the papers have been revised by their authors and therefore differ somewhat from the actual conference presentation. They have not, however, been extensively edited or revised, since the purpose of the series is to disseminate the conference presentations as rapidly as possible. Points of view and opinions reflected in this series are those of the authors, not the Association.

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Introduction

The 1979 National Conference on Higher Education theme focused on the changing character of the academic workforce. The shortage of faculty jobs is well documented by authors in the 1979 *Current Issues in Higher Education* series. A critical question is, What are some solutions to that shortage? The two papers in this monograph address this subject.

One probable growth area is in mid-level administrator jobs. Between 1972 and 1976, the ratio of administrators to faculty increased from one to five to one to four. Robert A. Scott argues that this trend will continue. Increasingly powerful external agencies will stimulate the creation of new types of administrator roles, which he describes; at the same time, the shrinking job market for faculty will push them into middle-management jobs. Scott foresees that the more experienced mid-level managers, seeing dwindling rewards and incentives in academe, will be attracted to middle-management jobs in private industry and government.

What happens to PhDs employed outside academe? Are there challenging, rewarding, and satisfying jobs for PhDs in the private and government sectors? Can humanists, as well as engineers, find happiness outside academe? Lewis C. Solmon answers these questions, contending that students must be more open-minded about career options and more active in attaining skills while in school which will be transferrable outside academe.

PhDs in Nonacademic Careers: Are There Good Jobs?

By Lewis C. Solmon

Introduction

The theme of the 1979 National Conference, like that of numerous national and local conferences held in the past several years, reflects a major concern of higher education institutions—the decline in academic job opportunities for doctorate-holders in all disciplines, and especially in the humanities. The late Allan M. Cartter predicted this decline in the mid-1960s. Although they take different approaches, most forecasters anticipate shortages of academic jobs through 1985, and moderate, if any gains during the 1990s. (Cartter, 1976: BLS, 1975; NSF, 1975; Dresch, 1975: Freeman, 1976: NCES, 1977).

According to the Bureau of Labor Statistics (BLS, 1975), new demand for PhDs in the 1980s and 1990s will depend mostly on academic expansion due to increased college enrollments. Yet demographic realities imply that increased enrollments will not be forthcoming in the next six or seven years. The National Science Foundation (NSF, 1975), however, estimated that "enrichment"—the educational upgrading of science and engineering positions to employ new PhD graduates—will provide new demand, and nonacademic employment settings in particular will absorb more new PhDs than academic settings.

Both the BLS and NSF, however different in assumptions, data, and methodology, conclude that unless market forces are more effective, underemployment, more than unemployment, will be a major problem for surplus PhDs (Cangialosi, 1976).

At least six different alternative methods for coping with the PhD surplus problem have been suggested: *Restricting graduate enrollments* in "low-demand" fields, thus eventually reducing the supply of PhDs in those fields; *closing down "surplus" programs* altogether in many institutions; and *escalating faculty turnover rates* by lowering the retirement age and/or eliminating tenure. These are stopgap, temporary solutions. They may work in the short run, but may create more problems in the long run.

Changing the emphasis of "low-demand" degrees to accommodate the job market requirements of the moment, or reorienting curricula to accommodate job-market requirements would be resisted on several counts. There is little incentive for tenured faculty to spend their time on new course development since this activity goes unrewarded in academe. Redirection of students to new course areas would magnify enrollment problems in traditional non-job-related areas. And most faculty members are not well informed about labor market needs. Finally, the needs of the job market might be very temporary, and constant revision would be required.

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Taking a laisse-faire approach, doing nothing while expecting the market responsiveness of students to work, would be appropriate if we knew that PhD students in all fields were market responsive and would adjust their education and career plans according to market demands. Some students are market responsive, more so at the graduate than the undergraduate level (Cartter, 1976). But, even humanities graduate students, those more likely than students in other disciplines to be hurt by a poor academic job market, expect to get faculty positions when they receive their PhDs (Solmon, Ochsner, & Hurwicz, forthcoming). If only one out of ten PhDs in the humanities will get an academic job, each student thinks, he/she will be that one.

The sixth method—*investigating other job sectors to identify potential good jobs outside academe for PhDs*—seems to us to be the best approach. Are there challenging, rewarding, satisfying jobs in the private and government sectors? Can PhDs from all disciplines, humanists as well as engineers, find satisfying, rewarding positions in the academic world?

For the past few years, we at the Higher Education Research Institute (HERI) have been analyzing the responses of PhD recipients in all fields of the physical and social sciences, engineering, and the humanities who were employed in academe, government, and private industry. Parts of this research have been funded by the National Science Foundation (NSF), the Ford Foundation, the Mellon Foundation, the Rockefeller Foundation, and the National Endowment for the Humanities (NEH).

The focus of this paper is to evalute nonacademic jobs for humanists, scientists, engineers, and social scientists. This involves analyzing the responses of PhD-holders from three separate studies.

In order to determine whether or not there are good jobs for those PhDs pursuing nonacademic careers, several issues must be addressed.

(1) How many PhD-holders will be seeking nonacademic jobs?

(2) Are PhDs currently holding nonacademic jobs?

(3) If so, where are they? How do people from different fields fit in outside academe?

(4) Will these jobs (and more or less of them) be available in the future? Are PhDs considered to be desirable employees by those doing the hiring?

(5) Are the nonacademic jobs good jobs, are they satisfying, do they use the knowledge acquired in school, do they enable research? Could PhD-holders perform effectively in jobs which have not in the past been viewed as PhD-level jobs?

(6) Will doctorate-holders be willing to look for and take these types of jobs? Do PhDs know how to find nonacademic jobs?

It must be stressed that these questions should be addressed separately for PhDs from different fields. Nonacademic employment has been commonplace for many fields but almost unknown for others. For example, over 93 percent of the history, philosophy, English, and modern-language doctorate-holders are employed full- or part-time in two- or four-year colleges. On the other hand, 84 percent of mathematicians and 81 percent of social scientists, but only half of the psychologists and earth scientists and one-third of the chemists and engineers were employed in that sector (Table 1). Clearly, nonacademic jobs have been available for at least 20 percent of all nonhumanities PhDs and for about two-thirds of the PhDs in some fields.

Academic Demand for PhDs

New jobs in academe arise for three reasons: replacement of those who die, retire, or leave academe; expansion when the number of students increases; and enrichment when student/faculty ratios fall.

Since so many young faculty were hired in the late 1960s, death and retirement rates will probably be low for the next several decades. New laws prohibiting mandatory retirement exacerbate this problem. Cost constraints are likely to limit reduction in class size and implementation of other labor-intensive reorganizations of the academy.

Expansion demand is dependent upon: (1) the size of the traditional college-aged cohort (18-21); (2) the proportion of that group who graduate from high school and go on to college; and (3) the number of adults, immigrants, and other new client groups who enroll in college. It was increases in the number of students that augmented faculty demand in the 1960s and early 1970s. But if the student body remains at a constant level, the same number of faculty members will be required each year. We know that growth of the traditional-age cohort will be lower in the 1980s than in the 1960s and 1970s, and that progression rates probably peaked out in the early 1970s. The only hope for sustained faculty demand is new clients. However, we have argued elsewhere that this prospect of adults replacing traditional students in numbers large enough to sustain demand is slim.

Again, field differences are important, since enrollment trends by major appear to be accentuating the problems. In 1970 three percent of all first-time, full-time freshmen indicated that they would major in English, but every year since 1975 only one percent of this group indicated this major. The share of those who anticipated majors in other arts and humanities disciplines fell from 12.7 percent in 1970 to 7.3 percent in 1978. Most of the growth indications of anticipated major accrued to the fields of business and engineering.

Table 2 provides some projections of actual BA recipients by field for those who were first-time, full-time freshmen in 1970 and 1978, for the major disciplines and the professional fields of education, business, and engineering. The results are a function of originally anticipated major, probability of dropping out by field, and field switching between freshman year and graduation. Although these adjustments improve the picture for arts and humanities, education, and the social sciences, their declining shares of graduates are still clearly evidenced. And the imminent decline in the total pool of college students will accentuate the drop in absolute numbers of students in these fields.

Reduced demand for faculty is only a problem if (1) new doctorates are still being produced, and (2) the new recipients still expect or desire faculty positions. The National Center for Educational Statistics (NCES) (1978) projects that in almost all fields annual PhD production will grow slightly or remain relatively constant between 1975 and 1986. Although recent trends (Chart 1) appear to contradict the NCES predictions for the humanities for years since 1973, this picture may be misleading. Since 1972, the average number of years between receipt of the BA and PhD has increased by at least one year for the humanities fields. This increase in time to get the doctorate is evidenced in other fields as well, although it always has taken longer to receive a PhD in the humanities.

This leads to the inference that the poor academic job market has resulted in many graduate students staying in school longer, since the opportunity costs of their doing so are low. But unless these people drop out or abandon their academic aspirations entirely, they will enter the job market within the next few years and increase the oversupply of applicants for scarce faculty positions.

Table 1. Employment Characteristics of All PhDs and 1977 PhD Recipients (in percentages)

	ALL PhDs	1977 PhD RECIPIENTS			
	PhDs employed FT/PT in two/four-year colleges	Planning employment in educational institution	(rank)	Seeking employment upon receipt of PhD	(rank)
Philosophy	98.9	69.6	(3)	28.9	(4)
English & American literature	97.5	74.1	(1)	34.3	(1)
Modern foreign languages	95.2	71.1	(2)	33.6	(3)
History	93.4	60.4	(5)	33.7	(2)
Mathematics	84.9	59.1	(6)	24.9	(5)
Social sciences	80.8	63.1	(4)	21.0	(7)
Biological sciences	73.1	22.9	(9)	11.8	(11)
Physics and astronomy	61.5	16.5	(11)	13.8	(10)
Psychology	50.3	35.8	(7)	23.2	(6)
Earth sciences	47.2	27.9	(8)	16.2	(9)
Chemistry	38.0	12.4	(12)	11.2	(12)
Engineering	34.5	22.8	(10)	19.5	(8)

Table 2. Probable Major for All Freshmen, All Institutions

	Probable major all 1st time/full-time freshmen	Share of total (%)	Number of majors allowing for field switching	Full-time persistence rates by anticipated major	Projected actual BA recipients	Share of total (%)
1970						
English	48,520	4	42,924	63.8	28,385	4
Arts, Humanities	205,400	18	179,783	76.4	137,354	20
Education	187,610	16	179,719	76.8	138,024	20
Social sciences	143,610	13	163,935	63.5	104,099	15
Business	262,006	23	225,895	65.1	147,058	21
Mathematics/statistics	53,392	5	35,734	83.9	29,981	4
Physical sciences	37,198	3	28,078	71.5	20,076	3
Engineering	139,090	12	83,875	61.0	51,163	7
Biological sciences	56,606	5	45,804	75.4	34,536	5
Total	1,133,764				689,676	
Total full-time enrollment 1970	1,617,324					
1978						
English	16,814	2	22,261	63.8	14,202	2
Arts, Humanities	+ 122,744	11	129,688	76.4	99,082	15
Education	+ 134,513	12	134,480	76.8	103,281	16
Social sciences	+ 89,115	8	132,513	63.5	84,146	13
Business	401,859	38	304,522	65.1	198,244	31
Mathematics/statistics	15,133	2	23,741	83.9	19,919	3
Physical sciences	40,354	5	29,525	71.5	21,110	3
Engineering	173,186	16	100,633	61.0	61,386	10
Biological sciences	77,345	7	51,368	75.4	38,732	6
Total	1,071,063				640,102	
Total full-time enrollment 1978	1,681,418					

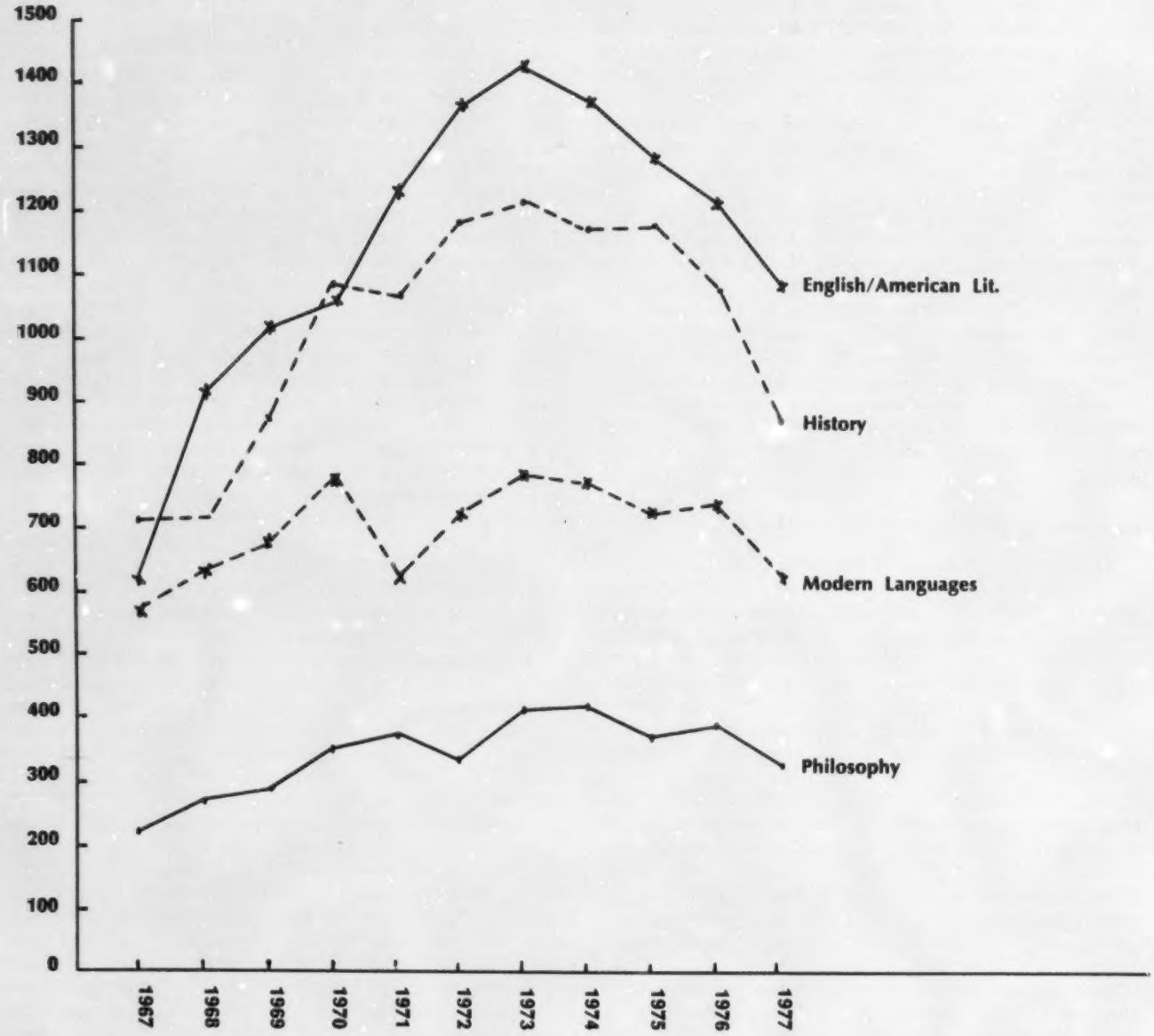
Fields in which alternatives to academe have been rare in the past (humanities, mathematics) are the fields that have shown the greatest undergraduate enrollment declines in this decade. Yet these are the fields where PhD production is anticipated to decline the least over the next few years, where unemployment for new PhDs is the largest, and where the greatest proportion of new PhDs still plan or hope to obtain academic employment.

One manifestation of the poor job market for doctorate-holders is the fact that most colleges and universities now require new junior faculty applicants to have their degrees already in hand before they will even be considered. From the Doctorate Records File of new PhDs (NRC, 1978) which asks about employment status at the time the degree is received, it is apparent that many more new PhDs are still seeking jobs at the time of that survey than was the case in the mid-1960s, when PhD candidates were being hired almost as soon as they passed their comprehensive examinations. But this unemployment rate varied in 1977 a great deal by field: from under 12 percent for chemistry (up from 10 percent in 1974) and biological sciences graduates (down from 12.3 percent in 1974) to over 33 percent for history, English, and modern-language graduates (up from about 30 percent in 1974). These figures are presented in Table 1.

Given these indications of a gloomy current and future academic job market, have new PhD recipients changed their aspirations? Table 1 provides data on career plans, in addition to the already mentioned statistics on unemployment rates of 1977 doctorate recipients and the percentage of all PhDs employed in two- or four-year colleges. Although the rank orderings are not identical, it is clear that fields in which the largest share of degree-holders has been employed in academe also are those in which the largest proportion of new graduates still aspire to academic employment. Moreover, these are the fields with the highest unemployment rates for new (1977) PhDs.

Data on sector of planned employment for new PhDs since 1974 reveal that in no field did the percentage planning on academic employment decline by more than eight percentage points. That is, despite the widespread publicity regarding scarcity of academic jobs, new PhDs are for the most part still intent upon securing these jobs. Fields in which alternatives to academe have been rare in the past (humanities, mathematics) are the fields that have shown the greatest undergraduate enrollment declines in this decade. Yet these are the fields where PhD production is anticipated to decline the least over the next few years, where unemployment for

Chart 1. Number of PhDs Produced Each Year in Selected Humanities Fields



new PhDs is the largest, and where the greatest proportion of new PhDs still plan or hope to obtain academic employment.

We believe that the future condition of PhD production and academic demand is quite clear. Others, particularly those who resist changes in colleges and universities, would disagree with our pessimistic forecasts. They look toward new clienteles for higher education and predict declining graduate school enrollments as "market forces" begin to have an effect. Our sense is that these countervailing forces for adjustment might have some effect, but unless adjustments are made, serious oversupplies will still be evidenced throughout the 1980s.

Solutions such as "make-work" faculty jobs, postdoctoral fellowships, or quick reindoctrination programs for PhD employment in the corporate world will not work, in my opinion, because the first two end up requiring or encouraging more students, and the latter is an ineffective alternative compared to the MBA degree. We have suggested that if subsidies are available, they would best be used to expand nonacademic job opportunities directly—in organizations ranging from museums to scientific research laboratories. In these cases productive work will get done; it presumably will produce some things of social value and will not require more students in order to get the jobs done.

Employment Settings for PhDs

Hence we must ask whether or not PhDs from various fields have demonstrated their willingness and ability to leave academe in order to obtain jobs. Table 3 provides summary data weighted to represent the 361,300 scientists, engineers, and humanists who earned doctorates within the 42-year period 1934-1976 and who were residing in the United States in February 1977. These data are reanalyzed from the Comprehensive Roster of the National Research Council (NRC, 1977). The table shows the primary work activities of full-time workers employed in science and the humanities, in two- or four-year colleges and elsewhere. We have combined teaching and research into one category since faculty may select either of these as their main activity. We assumed that the teaching/research group in academe was primarily faculty, while the teaching/research group outside academe was primarily conducting research. Those doing administration were also separated out, with the residual group labelled as "other."

Again, field differences in probabilities of holding faculty jobs are clear. Under half (44.4 percent) of all full-time employed science and engineering doctorates are doing research or teaching science in two- or four-year colleges, although 60 percent of social scientists are in this position. Under 30 percent of chemists and engineers find themselves in these jobs. The contrasts with the humanities are striking, since approximately 70 percent of doctorates from these fields do research or teach humanities in two- or four-year colleges. The range is from two-thirds of the historians to over three-quarters of the modern-language PhDs.

The first clue to the strength of the academic job market, and perhaps the flexibility of a discipline's subject matter, comes from the column indicating the proportion of PhDs doing research or teaching in college *outside* their broad field of training (science or humanities). There could be two reasons for outside teaching: poor faculty job opportunities in a field, or great demand for the discipline in professional schools or in nontraditional areas. Fewer than two percent of the hard scientists in any field hold these types of jobs, yet six percent of the social scientists do. This probably reflects the need for economists and sociologists in schools of business, education, public policy, public health, and so on. Over five percent of the humanists hold teaching or research jobs outside the humanities in two- or four-year colleges. This probably reflects on the poor academic job market within the humanities, although there is some evidence that philosophy is taught in medical, law, and education programs. The lowest proportion of those teaching outside the humanities is evidenced by English PhDs, probably because service courses are offered within English departments.

Field differences in the probabilities of working in academic administration are less striking than differences among faculty. More scientists than humanists generally administer within their fields, and more humanists administer outside the humanities. Perhaps this indicates that higher-level (university-wide) administrative positions are held by humanists. The relatively large share of hard scientists in administration may reflect rapid obsolescence in some science fields. The largest share of administrators comes from the social sciences, perhaps because of a growing sense that economics or sociology training might be useful in dealing with anticipated problems of the 1980s, such as the financial crunch, unionization, marketing of the college to increase enrollments, and accountability to consumers. Since humanists' problems of obsolescence are few, and since humanists do not appear to have been trained for any particular administrative tasks, we are led to infer that the dismal faculty job situation plays a major role in channeling humanists into administration.

This seems to be substantiated by the relatively large numbers of humanists in colleges or universities who are neither teachers, researchers, nor administrators. Apparently humanists are more likely to hold any college job than to hold jobs outside academe. Only psychologists are more likely than humanists to hold "other" college jobs; they probably do counseling and related psychological work.

It appears that humanists are overrepresented not only on faculties, but also in most other jobs in academe. We infer that this reflects not only their strong preferences, but their lack of skills to move into other employment sectors. The poor job market for humanists is reflected in part by the fact that more than twice the share of humanists than scientists are employed part-time (5.46 percent compared to 2.53 percent). When separate fields are compared, some differences are even greater. Since more women hold humanities PhDs than doctorates in other fields, it may be that many are doing part-time work by choice.

Nonacademic Jobs for PhDs

In looking at those in nonuniversity employment settings, it is clear that scientists leave academe quite easily. Indeed, more chemists and engineers do research outside than inside universities. It is also evident that many doctoral scientists are administrators in government or industry; they are much more likely to administer there than in colleges or universities. This movement from research to administration is a much more common phenomenon outside academe.

Fewer than ten percent of psychologists and social scientists do scientific research outside academe—these are the

Table 3. Full-Time Employment of PhDs by Field, Type of Employer and Primary Work Activity

	IN SCIENCE/HUMANITIES						OUTSIDE SCIENCE/HUMANITIES						TOTAL		
	Two- or four-year college			Other			Two- or four-year college			Other					
	Teaching Research	Administration	Other	Teaching Research	Administration	Other	Teaching Research	Administration	Other	Teaching Research	Administration	Other	Full Time	Part Time	Part-time or Full-time
All science/engineering	44.4	5.8	2.4	18.7	14.0	8.3	1.8	1.6	.1	.4	1.5	1.0	251,584	6,366	2.53
Mathematics	69.6	5.8	1.9	10.0	4.7	3.2	1.2	1.6		.4	.7	.9	14,178	237	1.67
Physics	44.2	5.4	1.0	26.1	12.9	3.8	1.8	1.4	.2	.5	1.3	1.3	22,707	384	1.69
Chemistry	29.0	2.9	.9	31.1	22.3	6.4	1.2	1.1	.1	.6	2.9	1.8	37,488	583	1.56
Earth sciences	45.3	4.2	.8	23.8	14.9	7.6	1.0	.8			.9	.7	8,353	121	1.45
Engineering	28.1	6.4	.9	29.4	22.3	8.6	.9	1.2		.1	1.6	.5	40,792	348	.85
Biological sciences	56.7	6.7	2.7	15.1	10.3	4.9	.4	1.3	.1	.2	.9	.8	41,745	1,140	2.73
Psychology	38.4	5.2	5.3	6.1	11.7	27.4	1.6	1.7	.1	.3	1.4	.6	28,642	1,789	6.25
Social sciences	59.7	7.0	2.9	6.7	5.8	4.0	5.9	3.3	.4	.9	1.9	1.4	37,487	1,082	2.89
All humanities	69.7	5.4	4.3	1.8	.7	1.2	5.3	4.0	1.0	1.0	2.0	3.7	51,054	2,785	5.46
History	66.2	4.4	4.2	2.4	1.5	2.1	4.9	3.8	1.2	1.7	2.4	5.2	13,974	471	3.37
Philosophy	71.7	4.3	4.8				6.8	4.2	.8	.7	2.6	4.1	4,233	191	4.51
English/Am. literature	75.7	4.9	4.6	1.2		.5	2.5	4.4	1.0	.4	1.9	3.0	14,391	730	5.07
Modern languages	76.9	4.8	3.7	2.6	.4	.9	2.6	2.3	.6	.9	1.1	3.3	8,326	547	6.57

Table 4. Overall Job Satisfaction, by Employment Sector and Field of PhD (percentage responding "very satisfied" and "satisfied")

	ACADEME				GOVERNMENT				PRIVATE INDUSTRY			
Field of PhD	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other
Humanities: Public Sector						79	81	78				
Humanities: Other	85	69	89	74		88	90	72		87	81	73
Biology	85	96	96			88	83	74		83	100	82
Civil Engineering	92					89	93	88				94
Electrical Engineering	89					77	72	75		87	90	80
Mechanical Engineering	86					79	73	75			92	92
Chemistry	90	88	100			83	84	66		80	89	87
Mathematics	79	88	88	82		80	59	69			74	84
Physics	88	71	93			82	79	67		90	92	86
Anthropology	71	95					100	83		69	100	91
Economics	85	95	100			85	84	89		100	93	
Political Science	89		93			60	85	67				
Psychology	81	88	80	90		73	79	77		76	85	88
Sociology	84	92				83	71			90		82

only science fields that were represented by less than ten percent. However, 27.4 percent of the psychologists fall into the nonacademic, other-activity category, which would indicate they take on counseling and related activities. Moreover, almost as many social scientists are doing research outside academe outside an area of science as inside (5.9 percent compared to 6.7 percent). Except for philosophers (6.8 percent), social scientists are the most likely to be carrying out research in new and unrelated areas. It should be noted that patterns for mathematicians more closely resemble humanists' patterns than those of other scientists.

It is striking that virtually none of the hard scientists or psychologists work outside science, despite their heavy representation outside academe. On the other hand, once outside colleges or universities, virtually no humanists work in their fields. Only 1.8 percent do humanities research outside academe and one percent do research outside the humanities. Whereas for the sciences 19.1 percent do research, 15.5 percent are administrators, and 9.3 percent do other things outside academe, the corresponding figures for the humanities are 2.8 percent, 2.7 percent, and 4.9 percent. And the science group includes mathematicians and social scientists, who are somewhat atypical.

Several conclusions can be inferred from these important data. First, although manpower analysts have usually minimized the projected problems of scientists compared to humanists, since the former group has wide-ranging contacts outside academe, they might be overly optimistic. PhDs in science seem to have virtually no nonacademic contacts outside the broad scientific community. Hence, although scientists can be somewhat casual about declining enrollments since they are willing to move outside the universities, they must be exceedingly aware of federal funding and other general economic trends which are needed to reinforce nonacademic science during times of declining enrollments. There is little evidence that scientists have been doing much other than scientific research, administration, and related activities when not in the universities. There are only 7,300 scientists and engineers (out of a quarter of a million) employed outside academe and outside science.

For humanists, there is no analogue to the nonacademic science community. For them, the dilemma may more realistically be described as any academic job versus any job outside the colleges or universities. When the academic market dries up, there is no cushion for a nonacademic humanities sector. And yet, 10.4 percent of full-time employed humanities PhDs are working outside academe. This means that approximately 5,300 PhDs are employed outside academe. The question of whether these individuals hold "doctorate-level" jobs is difficult to answer with Comprehensive Roster data. However, over half are working in either research or administration.

Our estimates from the Comprehensive Roster data are that approximately 7,300 PhD scientists and engineers and 5,300 humanists are employed outside academe in what might be considered "nontraditional" or "nonrelated" jobs. Since there are five times as many PhDs in the science and engineering categories as there are in the humanities, these figures may seem shocking. The advantage for the scientists lies in the cushion provided by the nonacademic science industry. Possibilities of job upgrading, federal grants, and new jobs from a prosperous economy are not available for humanists when the academic market dries up.

The question of future availability of nonacademic jobs is a difficult one. The answer depends upon the general strength of the economy, the international situation, and expenditures by governments (particularly the federal government) on research and development, among other things. The available data give us very little guidance on this question.

The National Science Foundation periodically provides information on federal funds for research, development, and other scientific activities in the sciences and engineering (NSF, 1977). Unfortunately, these data are not adequate for our purposes. Although figures are available up to 1978 by employment sector and by field, they are not cross-tabulated—we cannot tell how much research and development money goes to the physical sciences in industry, for example. The only possible use of these data is to extrapolate the three-year (1976-78) trend to 1985 to get a sense of what things might look like in the mid-1980s. If the extrapolations are linear, it appears that growth will be greatest in the private, industrial sector (as opposed to government, nonprofit organizations or colleges and universities), and in the fields of physical science, with slight growth in psychology and other social sciences. Yet significant changes in federal policy, the international situation, or the national mood could greatly alter these projected flows. And perhaps nonlinear extrapolations would yield different results. Hence, we are left to consider what actually is rather than what might be. Our hypothesis is that if there are currently satisfied, productive PhDs employed outside academe, there is hope that others might follow them in the future.

Humanists in the Public Sector

In 1977, HERI surveyed all humanities PhDs employed by the U.S. Federal Civil Service. This roster was supplemented by names from the Smithsonian Institution, the Library of Congress, a number of state civil-service employment lists, and state historical societies. The data were supplied by 568 men and 89 women who had doctorates in English, foreign languages, philosophy, history, or other humanities fields and were employed full-time in the government sector. Most of the men had PhDs in history (61 percent), whereas the PhDs held by the women were distributed more evenly among the five fields (35 percent history, 22 percent in other humanities, 19 percent in foreign languages, 17 percent in English, and 7 percent in philosophy).

Humanists in the Academic and Private Sectors

HERI conducted a similar survey of humanities PhDs in 1975. The emphasis of this earlier study, however, was on humanists employed full-time in academe and in the private sector. This survey includes 1,738 respondents—78 percent men, 22 percent women—in the fields of English (25 percent), foreign languages (21 percent), philosophy (13 percent), and history (41 percent).

Deans at 40 of the nation's top doctoral institutions appointed campus representatives who provided names and addresses for as many alumni in these four fields as could be found to hold nonteaching jobs. They also provided names and addresses of a matched sample (matched on sex, year of degree, and department) who held academic jobs. To augment the nonacademic sample, requests for participation were placed in *The New York Times*, the Organization of

American Historians *Newsletter*, and at the 1975 meetings of the Modern Language Association and The American Historical Association. In addition, names of humanities PhDs were obtained from several of the major *Fortune* 500 corporations. Since the sampling technique was unsystematic, we must emphasize that it is not representative of all humanities doctorate-holders. Of the 1,738 respondents, 1,177 held academic positions, 965 of whom were faculty members. Almost one-third—561—held nonacademic jobs in government and private industry.

Engineers, Scientists, and Social Scientists in the Academic, Public, and Private Sectors

In 1977, HERI conducted a survey of engineers, scientists, and social scientists with PhDs employed in academic, government, and private-industry jobs. Department chairs in each of 13 fields from 160 schools provided names and addresses of faculty who had changed jobs since 1974, who had not been hired directly from graduate school, and who had not left in order to retire.

The U.S. Civil Service Commission distributed questionnaires to all doctorate-holders in the Federal Civil Service in ten of the 13 fields and to random samples of those in biology, physics, and psychology. The last three were very large groups, and large numbers of doctorate-holders were available to be surveyed from other sectors.

Names of private-sector PhD respondents were obtained through several means. Each professional society in engineering, the sciences, and the social sciences published advertisements in their journals soliciting names of nonacademically (or "nontraditionally") employed PhDs. We also examined journals listing names of job changers. The National Research Council (NRC) provided a list of Comprehensive Roster members in 12 fields, who were employed "outside science." Finally, three professional societies—the American Psychological Association, the Institute for Electrical and Electronic Engineers, and the American Anthropological Association—provided lists of nonacademically employed PhDs from among their members.

Because of the varied sampling techniques used to identify private-sector employees, psychologists, engineers, and chemists were over-represented. The sample of government PhDs and mobile faculty, however, was fairly representative.

The sample reported here includes a total of 6,421 respondents (91 percent men and 9 percent women)—944 in biological sciences, 169 in civil engineering, 532 in electrical engineering, 212 in mechanical engineering, 1,002 in chemistry, 432 in mathematics, 802 in physics, 310 in anthropology, 409 in economics, 216 in political science, 1,192 in psychology, and 210 in sociology. Of the 6,421 respondents, 1,702 (26 percent) were faculty, 183 (3 percent) had other academic jobs, 3,200 (50 percent) had government jobs, and 1,336 (21 percent) worked in private industry. Most fields include 92 percent or more men, except anthropology with 31 percent women, sociology with 24 percent women, and psychology with 15 percent women.

Employment History

Members of three samples are categorized by their employment sectors and primary work activities for the analyses presented here. Within each of the four sectors—faculty, other academic, government, and private industry—there are four general work activities: teaching, research, administration, and anything other than teaching, research, or administration. When, for any given field, there were fewer than ten respondents in a particular sector and work activity, we eliminated that category from our analyses.

Before reporting the results of our surveys, a few preliminary points should be noted. Although underemployment of PhDs is a slippery concept, PhDs experience very little *unemployment*. Most estimates indicated about one percent unemployment. In any group, including the population of PhDs, there will be a few social incompetents who would be unemployed regardless of the overall state of the labor market. Additionally, some PhDs will have left their previous jobs to seek new ones: they are technically defined as unemployed, but they are really just between jobs. And some PhDs will be out of work voluntarily—they may be housewives or have decided to go into farming. The point is that despite the publicity, a PhD has high probability of finding a job. The job may be part-time, low status, or unrelated. But very little unemployment of PhDs exists.

What are the purposes of pursuing the PhD? Most doctoral candidates overwhelmingly reported interest in the subject matter of their fields as a major motive for entering their program. Personal satisfaction or enjoyment was another important motivation. Faculty encouragement usually came out high on the list of reasons for entering doctoral programs, a disappointing revelation given the poor job market. Although some doctorate-holders, particularly those employed outside academe, admitted to pursuing the PhD in order to improve their earnings capacity or to get a better job, relatively few were willing to admit this. It is possible, of course, that those who ended up in higher-paying nonacademic jobs because they could not get faculty jobs rationalized their situation by claiming that they always did want high incomes. Evidence from employed graduates seems to imply that although jobs and money are not acknowledged to be strong motivations, in reality they are. We did not ask about another factor which probably plays a major role in enrollment decisions. It is likely that many college graduates, particularly humanists, enroll in doctoral programs because they see few alternatives: good jobs for BA recipients are hard to find; law schools are getting crowded; and any field requiring prior mathematical training is out of reach for many. Hence, compared to other possibilities, graduate study still might be a reasonable choice for some college graduates.

The results of the NEH study show that 78 percent or more of all respondents, regardless of whether their job is closely, somewhat, or unrelated to their graduate study, feel that their PhD was necessary for their intended career. It seems that even if the training is not directly used it was necessary for a career in each sector. Those who were in nonacademic careers closely related to their PhDs less often wanted to become a college professor (research, 60 percent; administration, 55 percent; other 59 percent) than those in unrelated or somewhat related jobs (approximately 80 percent). It seems that those who can apply their skills in a closely related job outside academe do not feel they want to go gack to the university. However, those who cannot use their training want to return to an academic setting.

Interest in their field (reported by more than 90 percent) and personal satisfaction (77 percent) were given as important

reasons for entering a doctoral program, and job relatedness was not a major factor. More than 50 percent of the respondents cited encouragement by faculty advisors, and one-third said family encouragement was a reason for choosing a PhD program. Also, approximately one-third of the respondents entered a specific doctoral program for improved earnings potential and an offer of financial support. The results were fairly constant across all sectors and primary work activities.

As shown in the NEH study, in the Mellon study current job relatedness does not seem to influence what percent thought graduate study was necessary for their careers. Across all sectors and fields, a significantly high percentage of the respondents feel that their training was important. Those who are in jobs closely related to their training reveal that interest in their field of study was an important factor in their job choice and were less likely to cite earnings potential and scholarship incentives than those in somewhat or unrelated jobs. Perhaps because of greater interest in their fields, they waited for a more closely related job and chose the graduate program that suited their academic interests rather than one that promised monetary gains. Regardless of job relatedness, more than 50 percent chose their graduate program because of faculty encouragement. Draft postponement and absence of other attractive employment opportunities were rarely given as reasons for choosing a PhD program.

Between 61 and 94 percent of all humanists, regardless of their current employment sector or primary work activity, said they had expected to become a college or university teacher when they entered graduate school. Generally, humanists in academic jobs were more likely than the others to have expected to become college professors.

There was a similar, but not a parallel question on the science, engineering, and social science survey. This group of respondents was asked how strongly they agreed with the statement, "If I could begin my career again, I would like to become a college professor." The responses to this question probably indicate less about initial employment expectations than about current preferences, nostalgia for academe, current job satisfaction, and even a degree of cognitive dissonance (i.e,, the inclination to rationalize a current situation if it is not teaching).

Between 55 and 59 percent of scientists, engineers, and social scientists currently holding faculty positions strongly agree that they would become college professors again. Although the percentage of faculty teachers in most fields who said this was greater than the percentage who indicated this for other jobs, we might have expected greater differences. In mathematics, only 55 percent of college teachers, compared to 78 percent of academic researchers and 82 percent in "other" academic jobs strongly agree that they would become college professors if they could begin their careers again. Generally, one-third or fewer of the respondents in government or private industry said they would rather be teaching college. Within these sectors, administrators were least likely to prefer college teaching over their current positions.

Changes in career goals reflect both market conditions and motivations. Among faculty, more scientists and engineers than humanists have changed their career goals since entering graduate school. Scientists probably had originally intended to become practitioners or researchers, but ended up as teaching faculty. This was rarely the case for humanities faculty. On the other hand, more administrators indicated that their goals had changed; perhaps they found they preferred administration to teaching, or perhaps they realized teaching was an unrealistic aspiration. The largest percentage of goal changers are found outside academe. In all likelihood, all PhD candidates once expected to obtain academic jobs, but adjusted their goals when this was not realized.

The greatest percentages of doctorate-holders in our sample, across employment sectors and work activities, and particularly administrators, say more attractive opportunities elsewhere influenced them to change their career goals. Humanists (outside of teaching and research in academe) also say limited or unattractive teaching opportunities influenced them to change careers, and nonadministrative scientists and engineers outside academe say available job opportunities "in previous field" were limited or unattractive—undoubtedly referring to the declining academic job market, if not to the declining market for college teachers.

Where our data are presented by field, mathematics and electrical engineering PhDs show an interesting departure from those teaching in other fields. Fifty-four percent of teachers of mathematics and 50 percent of electrical engineering teachers say that available job opportunities in their previous fields were limited or unattractive, thus influencing their career goals to change from something else to teaching. Academically employed college teachers in psychology (49 percent), sociology (54 percent), biological science (46 percent), and anthropology (75 percent) say interest in their current fields induced them to teach these subjects, rather than to pursue previous career choices in different fields. Forty-eight percent of those in "other" government-sector jobs in physics and 42 percent similarly employed from the field of psychology cite the same influence.

Sixty-two percent of physics researchers in private industry say they didn't enjoy their first-choice careers and found more challenging positions elsewhere. Forty-five percent of physics faculty say that personal or family reasons influenced change in their career aspirations.

Regardless of employment sector, administrators are the most likely to be satisfied with their career progress to date, particularly academic administrators.

Job Satisfaction Among PhDs

To what extent are PhDs employed in various settings satisfied, productive and able to make use of their training? If those employed outside academe, particularly outside their fields, can achieve these things, the question posed in the title of this paper can be answered affirmatively.

The first important point is that most respondents in all our samples were satisfied or very satisfied overall with their jobs. Table 4 indicates the percentages of those who were either satisfied or very satisfied, by field, sector and primary work activity. Roughly 80 percent in each cell are in this category. However, it should be stressed that academe does not seem to be a more satisfying employment sector than private industry and is only slightly preferable to government.

Those in jobs more closely related to their doctoral training were somewhat more satisfied than others, but differences were not great. And faculty positions do not seem preferable to other positions in academe, government, or private industry. In particular, administrative jobs seem highly desirable.

In general, those who are most satisfied earn more, as do those in jobs closely related to their training. Obviously, those employed outside academe earn more than those who are in college or universities, and significantly more than faculty. Despite doctoral students' protests that earnings are not important to them, it does appear that high non-faculty salaries serve to compensate PhDs who are not holding faculty posts. On the other hand, regardless of work setting, those who are able to use their training tend to earn more. This is consistent with the human capital theory that education enhances productivity, which is reflected in earnings.

We can get some ideas about respondents' perceptions of their jobs by looking at their extent of agreement with various statements. Unfortunately, for humanists these statements were asked only of public-sector employees, not of faculty or PhDs employed in the private sector.

Almost all PhDs who were asked indicated that they were working at a professional level. With a few exceptions, over 70 percent in each field, sector and work activity so indicated. Researchers, teachers, and administrators in academe were more likely to so indicate. Yet the sense of professionalism was somewhat higher in private industry than academe and slightly lower in the government sector than in the other two.

Regardless of employment sector, administrators are the most likely to be satisfied with their career progress to date, particularly academic administrators. However, other than administrators, generally under half of the respondents, including faculty, are satisfied with their progress. And those who are employed outside academe are no more likely to feel this way. It is also interesting that most doctorate-holders do not feel their jobs offer good prospects for further advancement. Particularly negative in this respect are government employees. This is especially important since government jobs are least likely to match doctorate-holders' long-range goals. However, those in private industry are as likely as faculty to indicate their jobs fit their long-range goals, and academic administrators most frequently indicate that their jobs fit their goals.

Each of our PhD samples was asked about overall job satisfaction and satisfaction with a set of job attributes. In an attempt to define overall job satisfaction, each of the available components was regressed on overall job satisfaction, separately for the two humanities samples and for three broad field groups of scientists and engineers (Table 5). In all samples except engineering, satisfaction with *challenge* was the variable most highly correlated with overall job satisfaction. Challenge was the third strongest correlate for engineers. Number one for engineers (and fourth for hard scientists and fifth for social scientists) was *policy-making power,* probably reflecting the fact that many scientists in the sample were administrators. Other very important factors were opportunities for creativity, congenial work relationships, variety in activities, and status of position. Opportunities for scholarly pursuits, opportunities to use training or schooling, working conditions, resources to get the job done, and salary and fringe benefits were each one of the five most important correlates for one group. In general, the same factors were listed as important regardless of PhD field.

It is noteworthy that almost all of these factors could be available outside academe. When levels of satisfaction with various aspects of jobs were cross-tabulated by field, sector, and work activity, it became clear that significant proportions of those in each cell were satisfied with each aspect of their jobs. In other words, some jobs in all sectors have attributes that contribute to overall job satisfaction.

Use of training and opportunities for scholarship were not seen as the most important factors. It is also noteworthy that factors usually available in academe, such as good students, job security and competent colleagues were *not* seen as important factors. Again, the fact that a person works in academe is neither a necessary nor sufficient condition for job satisfaction. Between 50 and 60 percent of individual differences in overall job satisfaction levels can be explained by satisfaction with the aspects of jobs suggested. This implies that roughly 45 percent of satisfaction is due to omitted personal, background or other factors. That is, there is more to job satisfaction than merely the nature of the job.

In attempting to discern what other factors besides the job traits listed in Table 5 were related to overall job satisfaction, we ran several more separate regressions for the two humanities samples and for hard sciences, social sciences, and engineering. The similarity of the conclusions for all PhD fields was striking. The main points are summarized below:

(1) Income, or at least feeling well paid compared to others with the same amount of education, is a very important determinant of job satisfaction.

(2) Having a job which is related to one's doctoral training is also important. Yet controlling for this, those in jobs requiring additional training while on the job are more satisfied than others.

(3) Administrative jobs are preferred to teaching, or even to research, and government jobs are *less* preferred than those in academe or private industry.

(4) Those who have published more over their careers are more satisfied than others; however, currently doing research is seen as less important. It is probable that prior research opens doors to good jobs outside the research area; good researchers seem to be promoted into other, particularly administrative, jobs.

(5) Older workers are generally more satisfied than younger ones, but controlling for age, the longer one holds the same job, the *less* satisfied he or she is. This is important to remember when the efficacy of the doctorate degree is evaluated by looking at attitudes of *new* doctorate recipients.

(6) PhDs who received their doctorates from more prestigious institutions are more satisfied. This probably reflects a credentialling effect.

(7) Those who indicate they are mobile, are and were willing to move for a good job, are more satisfied. This is particularly important given our findings that employed doctorate-holders are relatively immobile. For example, only one-third of the public-sector humanists in our sample indicated that they would search nationwide if they now were looking for a job. In most of the science fields, government employees are least mobile, probably due to the concentration of jobs in Washington, D.C. Those in private industry are generally somewhat more mobile than academics, with researchers in all sectors more flexible than administrators. In all fields

Table 5. The Definition of Overall Job Satisfaction

	POPULATION				
	Mellon Humanities: Faculty, Private, Government	NEH Humanities: Public Sector	NSF Social Sciences	NSF Hard Sciences	NSF Engineering
Salary and fringe benefits	x		3		o
Opportunity for scholarly pursuits	o	4	o	o	o
Opportunity for creativity	x	o	2	2	4
Opportunity to use training or schooling	x	5	o	o	o
Resources to get job done	x				o
Teaching load	x	5	o	o	
Quality of students	x	x			
Pressure to publish	x	x	o		
Internal politics	x		o		o
Working conditions (hrs., loc.)	4		o	o	
Status (of position)	o	o	o	o	5
Autonomy and independence	o	o	o	3	o
Variety in activities	5		o	o	1
Policy-making power		2	o	o	2
Congenial work relationships	3		5	4	
Competency of colleagues		3	4	5	
Opportunity for different (better) job at this institution/organization				o	o
Visibility for jobs at other institutions/organizations	x			o	
Challenge	1		1	1	3
Job security		1		o	
Prestige of employer	o	o		o	o
Salary	o	x	x	x	x
Fringe benefits		x	x	x	x
Extent of responsibility	o	x	x	x	x
Opportunity for leisure time		x	x	x	x
Career progress to date	2	x	x	x	x
R^2	.573	.556	.518	.499	.517

Note: Numbers in columns indicate rank of importance of factor.
o—indicates a statistically significant relationship to overall job satisfaction but not one of five most important factors.
x—indicates variable was not included.

Table 6. Percentage of Respondents in Jobs Closely Related to PhD Field by Primary Work Activity Within Job Sector

Field of PhD	FACULTY				OTHER ACADEMIC				GOVERNMENT				PRIVATE INDUSTRY			
	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other
Humanities: Public Sector										73	42	45				
Humanities: Other	85					62	31	28		48	26	35		39	13	11
Biological sciences	83	83	46							84	48	48		68	23	24
Civil engineering	92									89	57	68				82
Electrical engineering	77									62	42	48	100	68	43	53
Mechanical engineering	86									64	47	59			31	62
Chemistry	84	88								64	40	18		63	24	13
Mathematics	83	88		83			25			47	22	46			32	16
Physics	81	90								54	40	12		50	29	4
Anthropology	90	85									47	54		69	50	20
Economics	97	100					58			87	64	61		91	50	
Political science	89						36				26	40				
Psychology	82	74	40	92			42	69		66	48	79		49	48	74
Sociology	91	92								67	44					27

Table 7. My Skills Are Fully Utilized on My Job (percentage responding "very much")

Field of PhD	FACULTY				OTHER ACADEMIC				GOVERNMENT				PRIVATE INDUSTRY			
	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other	Teaching	Research	Administration	Other
Humanities: Public Sector										38	32	31				
Biological sciences	48	61	46	25			12		50	50	32	22		33	38	18
Civil engineering	48	75	50	29			20			57	33	36			33	53
Electrical engineering	60	60	71	33			56			32	26	22	100	50	44	32
Mechanical engineering	65	80	75	44			40			28	24	21		60	46	31
Chemistry	55	75	50	50			57	50		37	37	11		38	47	30
Mathematics	28	71	50	54			44			43	31	33		25	32	24
Physics	50	62	33		20		31			34	35	13		48	36	34
Anthropology	30	61	40	60			57	100	50	50	18	25		46	20	11
Economics	56	57	80	50			67			32	43	20		67	71	25
Political science	55	50	75				100		100	90	69	72		71	83	100
Psychology	41	56	46	54			43	77		36	37	29		42	45	54
Sociology	37	85	83				25			33	28	50		40	29	46

under half of the PhDs said they would look nationwide for a new job.

(8) Those who went to graduate school because they saw few alternatives are less satisfied than others. Of course, they probably would have been less satisfied in any career they had pursued.

(9) Finally, controlling for all the factors mentioned, those who consider their jobs to be nontraditional are more satisfied than others. Although a number of factors are associated with this perception, inability to use training and a personal resolution to change one's aspirations seem to be the strongest correlates of nontraditionality. It seems that those who are in unrelated jobs and yearn to return to academe are particularly dissatisfied. However, once doctorate-holders realize that this hope is somewhat futile and begin to take steps to succeed outside academe, they can make satisfying progress in nontraditional lines of endeavor.

One of the fundamental factors in determining whether or not a nonacademic job is a good one for a doctorate-holder is relatedness of job to doctoral training. Yet relatedness is a concept confounded by several others. For example, research and writing jobs are usually considered to be related, even if other jobs are more satisfying. Also, if graduate training provides skills and knowledge useful on the job, the job is considered related even if it does not utilize course content. Hence, both students and their faculty should be more concerned that students acquire competencies useful for many types of work (which they do) and make certain that the utility of these skills are made known to potential nonacademic employers (which is rarely done). The holder of a PhD in English literature may be unlikely to utilize his or her knowledge of the plots of plays anywhere except in the classroom. But surely research, writing, critical thinking, analytical and other skills are transferable. This obvious point is often ignored.

In several of our studies we have found that more important than the perception that a PhD holder's job is related to his graduate courses is the feeling that his or her *skills are fully utilized.* Indeed, the latter is important even after controlling for the former. This has led us to emphasize that a good job is one that utilizes a person's whole range of skills, experiences and competencies, rather than merely the content of graduate school courses. Table 6 indicates the proportions of those who said they hold jobs closely related to their graduate training. This is followed by Table 7, which indicates the proportions of PhDs in the same employment categories who feel their skills are fully utilized. It is immediately apparent that more people sense that their skills are underutilized than feel they are in unrelated jobs. In fact, by trying to match a job to one's graduate-course content, one probably is foregoing the opportunity to utilize other skills. This might be costly in both career progress and job satisfaction later on.

Recommendations for Current Graduate Students

We believe our studies suggest a number of courses of action for those currently considering or already in graduate school. In the first place, students must keep up to date with job-market information. This is not as simple as it sounds, since many faculty either do not know what the situation really is, or are unwilling to believe bad news, or will not be honest with students who are needed to fill classrooms and to teach undesirable freshman courses. Students must be aware of "second-level ignorance"; that is, not to accept the argument that the market will be bad only for others, not for oneself. Almost every student is told he or she will be an exception to the job crunch because of his own high ability, the top reputation of his program, and so on. But everyone is not at the top—it is important to be realistic about one's prospects. Finally, it is important to be aware that the job market can change. A jump in the birth rate will increase jobs for elementary teachers in only four years and for the people who train teachers even sooner. A new federal research policy could increase or decrease jobs for scientists both in and out of academe very quickly. Hence, constant monitoring is the key.

Second, students should be open-minded about career options. Our data show clearly that academe is *not* the only road to success or satisfaction. Students should try to learn about nonacademic job possibilities. Faculty, who probably have never worked outside academe, are not a good source of career information. Our data also show that, particularly in the humanities, few faculty view helping students prepare for jobs as part of their role. Another reason students should not rely solely on faculty is the fact that they are in a conflict-of-interest situation. They need students, and they may say whatever it takes to fill their classes. Also, many faculty like to justify their own existence by stressing the idyllic life they lead as academicians.

Third, students should try to acquire broader competencies from their graduate schools and from other experiences, rather than merely to learn the content of their major courses. Graduate programs can be used to obtain research, writing, and interpersonal skills. Outside the program there is useful knowledge to be gained. Many PhD-holders are very narrow, in the sense that since undergraduate days they have taken few courses outside their specialization. This, again, is particularly the case for humanists. Some of the most successful recent education PhDs have taken courses offered by the business schools; likewise, sociologists with some economics or psychology might be more marketable than their more narrowly focused colleagues.

Fourth, students should make use of campus counseling and placement facilities outside the department. Most graduate students ignore these, but they can be useful. And these facilities should be utilized early, not one month before graduation. Advisement centers do more than match students with jobs; they can give advice on course options, ways to acquire skills, and how to learn about what jobs are best suited to one's talents.

Fifth, students must remember that there are more ways to find a job than luck, chance, and one's faculty advisor. In addition to the placement center, jobs are obtained through direct application, civil-service application, employment agencies, and contacts from nonacademic activities. When any of these methods are used, the applicant should stress more than grades and PhD coursework. Stress competencies like research and writing skills, and organizational, management and interpersonal skills. These become much more important as one progresses through a career path.

Finally, there are no easy answers, but there are many people with apparently simple solutions to the job crisis. Two examples might suffice here. There are a number of books out

now on how to get a job—the most notable being *What Color is Your Parachute?* One type of advice it offers is not to apply for jobs directly, to arrange for an interview with a high-level executive "to learn about the company." The idea is that during the discussion the applicant can convince the executive of his or her brilliance and then will receive an unsolicited job offer. The idea was good when it was rarely used. Now, employers get annoyed when ten graduates a week call to learn about the firm.

A second type of easy answer is offered in the form of brief career-preparation programs offered upon graduation. Students must be careful with these also. Those that have obtained jobs for thirty of the top students from Harvard and Yale might not be able to get jobs for the "typical" graduate students. And surely those that were hired were not hired for what they learned in a single summer. Why should a firm hire a humanities PhD with a six-week cram course in business rather than an MBA student of equal ability?

On the other hand, the student who plans ahead and develops a graduate program which includes business or other career-relevant courses will be able to demonstrate a thorough knowledge of topics of concern and will appear to corporate recruiters to have logically planned for a nonacademic career. This is in contrast to postgraduate patch-work efforts, during which the student's interest is certified as being an afterthought. Of course, faculty in enrollment-scarce fields prefer the postgraduate programs because the alternative is to suffer somewhat smaller enrollments in certain classes. Furthermore, most humanities PhDs do not have the competencies to compete with an MBA on the latter's turf. Those with PhDs in the disciplines have in the past worked successfully in nontraditional settings; but they have succeeded because of their own skills, competencies and knowledge, not because of easy-answer retooling programs. Clearly, scientific evaluations of these programs are required before large numbers of students can place much faith in them. Students should assess what they have to sell, and sell it.

The final message to be offered is that students should not despair. Despite the ups and downs of the labor market for PhDs, almost all the respondents to our surveys were glad they had the graduate education they did have. New entrants to the labor force have always been the most dissatisfied; satisfaction grows with experience. Few doctorate-holders are unemployed for long—markets adjust and people adjust. And there are good jobs available outside academe.

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Robots or Reinsmen: Job Opportunities And Professional Standing for Collegiate Administrators in the 1980s

By Robert A. Scott

Growth in administration will be directly related to new institutional challenges. Uncertainty about the environment of higher education will result in new activities and the increasing specialization of organizational components.

Lyman Glenny has referred to middle-level collegiate administrators as "anonymous leaders" (Glenny, 1972). They have also been called *Lords, Squires, and Yeomen* because of their limited mobility in a highly stratified hierarchical setting (Scott, 1978).

Because collegiate middle-managers evoke such a variety of terms, and because their future prospects for job opportunities and professional standing appear so mixed, I have attempted to capture this uncertain status in a new choice of metaphors: robots and reinsmen.

The Robot, of course, is a popular image for programmed behavior of modest flexibility. The picture we have is of a stiff, squat, R2D2-like character who works diligently at his assigned duties, but has limited capabilities. He can calculate data quickly, but manipulate only what has been programmed.

A reinsman, however—I could not bring myself to add reinsperson to the ranks of Norseperson—conveys the image of one who has great ability and courage, but stays in the background. He or she is the anonymous or unsung hero; attention is focused on others in life and on the movie screen.

The stagecoach reinsman had many duties to perform, often simultaneously. He developed his skills in an environment that required quick and continual change; he learned to deal calmly with the unexpected (Wrapp, 1979). The reinsman had to avoid the hazards of potholes and enemies, be alert to the condition of his charges, and consider the security and destination of his passengers; he had to keep to a schedule no matter what surprises occurred in his path. The robot, by way of contrast, operates in a highly controlled environment.

Which of these models provides a more accurate picture of future job opportunities and professional standing for mid-level administrators in colleges and universities? This is the matter on which I wish to speculate. Using data on collegiate middle-managers and employment compiled during a 1977-78 study sponsored by the Exxon Education Foundation, and more recent data gleaned from a variety of sources, I have attempted, in Nisbet's terms, to offer portraits of college administrators against the social landscape that is only now coming into view (Scott, 1978; 1979a).

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By job opportunities I mean to include new categories of jobs, new levels of responsibility in existing job categories, and an increased number of jobs; career paths and mobility; salaries and annual increases; and the challenges of new problems and assignments. For years these forms of job opportunity have been created in large part by enrollment growth; more students meant more institutions, more services to be provided, and more levels of administration. This growth in institutional size and complexity has resulted in the expansion, specialization, and differentiation of administrative jobs (Parsons and Platt, 1973).

According to a National Education Association (NEA) analysis of Higher Education General Information Survey (HEGIS) data, administrators accounted for one in five higher education positions in 1972-73 and one in four in 1976-77 (*The Chronicle of Higher Education*, 1977, p. 7). Even with the stable enrollments of recent years, the growth, specialization, and differentiation of administrative positions seem to have continued, especially at two-year and four-year colleges (Minter and Bowen, 1978, p. 28). The causes now are the intensified needs for data, donations, and students, and institutional responses to governmental requirements (Scott, 1979b).

Forces Affecting Growth and Change

But what about the future? If the projections of declining enrollments and need for faculty come true, what will be the effect on administrative positions? If institutional growth in size and responses to compliance requirements have been major causes of job expansion and specialization in the past, what will happen in the next decade? Can we expect a decline in collegiate administrative opportunities comparable to changes in the student and faculty estates? The NEA and others, such as Froomkin and McCully (1977, p. 52), suggest not. Their data show greater growth in administrative positions than in faculty posts, and that administrative positions are not dropped as rapidly as faculty positions. Their conclusions have the ring of truth, and seem to be in line with common expectations. After all, most budget-cutting exercises are led by administrators, and in these exercises faculty are often looked upon as individual units of specialization, whereas administrative departments are considered as systems with necessary components.

The reasons to expect continued growth in administration have been described by many scholars (Froomkin and McCully, *op. cit.*; Minter and Bowen, *op. cit.*; Kerr, 1972; Perkins, 1973; Bowen, 1977; Mayhew, 1977a; Baldridge, *et al.*, 1978). They argue that because of influences from the external environment and the complex decisions (both technical and political) to be made on campus, presidents and other

senior executives will need more help from collegiate middle-managers, the information finders and analysts.* In other words, growth in administration will be directly related to new institutional challenges. Uncertainty about the environment of higher education will result in new activities and the increasing specialization of organizational components.

Harold Howe II (1977, p. 18) ascribes this complexity on campus to the same "fog that has settled over American society itself." Americans have fewer shared purposes, more contending groups [each with its own arsenal of information], and a less clear understanding of where we are heading. The functions that will encourage growth include the use and maintenance of new technologies, relations with off-campus constituents and other claimants that seem to necessitate institutional counterparts, the need for human and financial resources, the need to offer services to students, and relations with faculty and other employees. The likely consequences include, in addition to a greater proportion of administrators to faculty—although this will vary by institutional type and control—increased conflict within institutions, and therefore increasingly complex grievance procedures; increased unionization; and greater centralization, as well as bureaucratization, on campus as well as in society at large (Yarmolinsky, 1978, pp. 130, 167; Meyer, 1978, p. 79; Argyris, 1979, p. 15). The results will be more rules, regulations, controls, official custodial functions, and layers of supervision.

The categories which will experience growth are those specialties that work most closely with the environment of the institution: the "financial technocrats" (Baldridge, *et al., op. cit.,* p. 208), fund raisers, lawyers, personnel managers, labor negotiators, safety officials, institutional researchers, and management information specialists. The specialized functions and the specialist will grow in number and in power. Other administrative functions, such as student services, may find some increase in importance, but I doubt that they will increase greatly in either size or power (Scott, 1978).

There is, of course, some possibility that administrative growth will not continue. Certainly if faculty dominance of governance bodies expands or if the nature of collegiate institutions changes in some radical way, one might imagine a different future. It does seem that growth in administration is affected by the trends in academic careers and university missions, which are in turn affected by the general economy and the funding of research and service activities. And it is possible that management and planning activities will not take hold in universities; after all, there is some doubt about their success in business (Cyert, 1975, p. 6; Wrapp, *op. cit.*). Nevertheless, I agree with Talcott Parsons, who argues that, on the whole, organizational forms in higher education are so firmly institutionalized that their patterns are unlikely to change profoundly and that the forces of differentiation and specialization of positions will continue (Parsons, 1978, p. 112). The basic organizational unit is the professor, the next is the research group or the department. These units will continue to prevail.

Another force to limit change is the national occupational association, which encourages standardization of position descriptions and office procedures. Since these associations are often dominated by officials from older, large institutions, which are least likely to change in basic administrative form, the professional identities of registrars, business officers, and other officials take on the stamp of the dominant group in the association, and they develop resistance to organizational reform.

These companion facts about faculty and administrators—these organizational valences—will tend to limit structural changes.

Young faculty who fail to gain tenure and older faculty who lack students because of lower enrollment will become the new sources of middle-level administrators.

Projections for Administrative Employment

Unfortunately, there are no projections for administrative employment, only extrapolations that can be made from historical and projected data about student enrollment, faculty positions, and current fund expenditures on administration and general expenses. Such extrapolations are not reliable, but they are suggestive; and when coupled with an examination of other issues and trends, they can help project employment opportunities in a general way.

I think we will see in the 1980s an increased emphasis on administration, but with some new problems and dimensions. I think the major change will be in the source of administrators. As institutions close ranks to evaluate and protect themselves; as faculty concern for the uncertainty in the external environment, and for finances, positions, and administrative growth increases; and as lessened student demand leaves both tenured faculty and young PhDs without classes to teach, there will be a heightened awareness and desire by faculty to employ other faculty in administrative positions. This tendency may be helped along if salaries in higher education fail to keep pace with those of other professionals and the various specialists needed by institutions go instead into industry, private practice, or government work.

For many years, the major sources of administrators were recent alumni and mid-career transfers from other segments of the economy (Bess and Lodahl, 1969; Scott, 1978). I predict that this pattern will change and that given the oversupply of PhDs (*Monthly Labor Review,* October 1978, pp. 48-50), young faculty who fail to gain tenure and older faculty who lack students because of lower enrollment will become the new sources of middle-level administrators. I believe that this change will take place both for financial reasons (i.e., one way to make use of faculty without students is to give them an administrative duty that needs doing) and for reasons of value (i.e., faculty will want as administrators those who at least appear to share values in common.)**

While this change will probably take place first in the least technical areas, such as in student services and in the staffing of committees, it is not unreasonable to expect new efforts

*One might contrast the levels of administration in this way: the lowest level engages in transactions; the middle-level defines and gathers information; and the top-level makes decisions.

**See Ripley, 1979, p. 8. See also Cyert and March, 1963, who argue that as environmental uncertainty increases, system members undertake more boundary-spanning activity to gather and process information, and thereby try to reduce uncertainty.

to make possible the training of faculty for more specialized administrative functions. There is now a program to train young humanists for business; why not a similar program for university administrative posts? ("Philosophy to Profits").

Nevertheless, the structural and environmental limits to collegiate middle-management careers will continue. This is almost inevitable given the mixed organizational character of colleges and universities and the influence of faculty on the selection of senior officers. In the mixed organizational form, which includes bureaucratic, collegial, and political elements, each segment has its own career patterns or ladders (see Scott, 1978, p. 10).

Rosabeth Moss Kanter has written cogently about the "opportunity problem" in higher education; about the fact that low growth and relatively horizontal organizations offer few opportunities for advancement (1978b). The issues of career paths and mobility are also examined thoroughly in *Lords, Squires, and Yeomen*. I would like to comment first on job motivation, satisfaction, and compensation, and then on the issues of job status and professional standing.

Institutions have not shown support for the notion of organizational development through personnel development.

Job Motivation, Satisfaction, and Compensation in Middle Management

I have found several reasons to be concerned about the nature of middle-level collegiate positions. That these positions are important has been noted; that job incumbents want to be involved, valued, and rewarded has become a commonplace; that satisfaction in work is related to job performance is often cited. But how can we ensure that jobs remain satisfying and performance remains high when there are few opportunities for professional growth in collegiate administration? How can we keep staff members emotionally involved in their institution's aims when they do similar work year after year? If jobs are a source of meaning and of pride (Kanter, 1977; 1978a, pp. 55-60) and if career advancement and self-identity are intertwined (London, 1978, p. 29), how can we enhance individual self-esteem in an organization that offers limited mobility?

It is not uncommon when interviewing collegiate middle managers to find a director of an office who has served for twenty years or more in the same position, during which time his office's responsibilities have grown and expanded. In similar fashion, the whole administrative organization of colleges has generally become more complex and added administrative layers. This longevity of office directors can serve to retard even further the already limited internal mobility of junior officers in the relatively flat organizational structures of colleges (Scott, 1978).

One issue brought to light by this finding of longevity is job satisfaction. Most jobs can seem interesting at first, but then a dilemma of competing values emerges. Organizations want stability (Argyris, 1972, p. 7); incumbents want to use their skills fully in challenging new experiences and in positions of higher status (Bisconti and Solmon, 1977, p. 26). However, stability requires that tasks become routine, and routine can result in repetitive, boring work. For someone in a middle-level position with little hope of achieving the American expectation of advancement, the routines of work can become a greater influence than the occasional requirements to solve a new problem (see Cooper, Morgan, Foley, and Kaplan, 1979). And now, with the prospects of even longer work lives, this issue takes on greater urgency. For not only does this mean potentially more years of boredom, but also more points in time for evaluation and training.

While we are not certain about the correlation of job satisfaction to productivity among the better educated, many scholars argue that there are strong relationships between job opportunities, aspirations, self-esteem, and morale, that these are related to work alienation (Bucher and Stelling, 1977; Kanter, 1978a, pp. 53, 54, 62), and that altogether these factors are associated with productivity (Kanter, 1979, p. E 17; Elliot Richardson, 1976, p. 242).

But institutions have not shown support for the notion of organizational development through personnel development (R. Richardson, 1975). Most campus training programs are for clerical employees. While major off-campus programs are designed for executive-level staff, they are expensive and time-consuming; consequently few middle managers attend. Instead, they participate in workshops sponsored by their associations (Scott, 1978). And those sponsored by institutional associations for carefully selected faculty chosen for senior administrative positions may be as much "prestige-conferring" as actually helpful in training for specific skills (Kanter and Wheatley, n.d.; Baumgartel, 1977).

While salary levels have been discussed elsewhere, it should be said in this context that compensation is another aspect of job opportunity that is severely limited (Bowen, 1978). Likely consequences of the complex of forces already discussed are that the most ambitious of administrators will look outside of higher education for employment; that college administrators will be selected because they are available, not because they are best; and that institutions will suffer from poor administration. It seems to me that these are severe consequences for both institutions and individuals.

The consequences for institutions have been discussed by Bowen *(ibid.)*. If opportunities, salaries, and status are not improved, it will become difficult for institutions to recruit and retain highly skilled administrators. Colleges will have to rely heavily on the less ambitious, who in Kanter's terms are "stuck" (1979), and on faculty who shift to administration from teaching. Also, with large numbers of faculty and recent PhDs available, an inflation of required credentials may occur, which could result in overeducation and underemployment (Kanter, 1978a, p. 64; Ochsner and Solmon, 1979, p. 41). The results for individuals may not be so obvious, but certainly a loss of self-esteem is among them. For in our society self-respect comes largely through the act of working (Kanter, *ibid.*).

This equation of satisfying work and self-esteem is affected in colleges by the nature of the academic status structure. On campus, faculty, especially tenured faculty, have the highest prestige and more influence than virtually any administrator (Parsons and Platt, *op. cit.*, p. 136). In fact, one can present a good case that administrative positions have been created to do the duties cast off by a faculty spread thin by commit-

ments. As the faculty role has taken on responsibilities for research, public service, consulting, and campus governance in addition to teaching, duties in admissions, registration, and the like have been assigned to new support positions. These new people are asked to perform duties associated with faculty roles but without the same degree of formal responsibility or the same kinds of rewards (*ibid.*, p. 409; Bowen, 1978). The result, according to Parsons and Platt, is a diminution of loyalty and an increase in resentment and alienation on the part of the emergent campus professions (Parsons and Platt, *op. cit.*; Leavitt, 1978, p. 158; Scott, 1978).

Perhaps the best place to look first in assessing the relative professional standing of faculty and administrators on campus is at salary levels and annual increases. According to Minter and Bowen (1978), salaries of faculty members in the past two years have almost kept pace with inflation. In another source, Bowen (1978) argues that the "remuneration of administrative officials in colleges and universities moves roughly, but not exactly, parallel to that for faculty" (p. 22). If in his computations he were also to include associate and assistant deans and directors of support services, the picture would be both more complete and worse. On both dimensions—gross salaries and annual increases—middle-level administrator salaries are lower than those for faculty. Another examination, which I believe would result in similar conclusions, would be to compare the levels and ranges in salary classification schedules.*

Expectations, of course, are higher than this. While most managers and professionals never harbor the illusion of membership in the top councils of the establishment, or put such a dream aside early in their careers, they desire respect and expect advancement up the ladder of success in our increasingly large, multilayered, bureaucratic institutions (Kanter, 1978b, p. 63; Cooper, *et al., op cit.*; Ginsberg, 1979). Through education and experience, and the encouragement of Washington-based associations, collegiate administrators expect satisfying career opportunities. But even when administrators adapt faculty ideologies (Dibble, 1962, pp. 229-241) and orient themselves toward service, conflicts exist and expectations languish. There is, simply and tragically, a lack of validation for the importance of the middle manager's role. They experience a kind of "grudging acceptance" (Perkins, *op. cit.*, p. 8). On more than one campus I visited, admissions officers had not been invited to the president's fall or spring receptions, and mid-level administrators considered experts with specialized information off campus were often ignored on their home campus (Scott, 1978; Thomas, 1978). Middle managers experience ambiguity: they are to be servants to students and faculty (to "hold their coats," according to Doris Grumbach, 1978), and instruments of institutional policy set by senior administrators and trustees. They are to be both servants (as support staff) and policemen (as monitors of procedures).

Change in Collegiate Administration: Effect on Middle Management

But, these conclusions notwithstanding, there is hope. Like many of the collegiate middle managers interviewed, I am optimistic. They are optimistic, by the way, not because they believe conditions will improve, but that *they* will get better and rise to meet the new needs. These are the reinsmen on whom higher education must rely.

College and university administrators of all ranks, but especially presidents, must decide whether their terms of office will be characterized by institutional paralysis or by thoughtful initiatives. An organization's climate, after all, is in large measure a function of the behavior of its top-level members and the procedures they institute (Scott, 1979b). Paralysis will result from a gradually more bureaucratic, robot-like administration. Thoughtful initiatives will be possible only if the president and those in his or her shadow have vision and act with purpose, like the reinsmen who travelled the Santa Fe Trail. The reader might well ask whether this will be possible, and what we can predict for collegiate middle management. The social forces referenced earlier will of course affect the future directions of collegiate institutions, both as educational enterprises and as employers. Nevertheless, there will be changes in collegiate administration. New clientele will require new services, and new public policies and patterns of attendance may lead us to expect a "reduction in such services as the health center, counselling clinic, campus dining rooms, and elaborate programs of recreation" (Mayhew, *ibid.*, p. 50). However, this decline in student services, except perhaps in the career-planning office and a few other services, will be offset by changing styles of management and a growing bureaucracy in other support areas.

There is a great diffusion, and some confusion of authority on many campuses. Students, faculty, governing boards, and governmental agencies are increasingly involved in questions of authority and management (Ness, 1977, p. 136). Concomitantly, there is a growing tendency toward bureaucratization, in part as a necessary response to external demands for accountability (Bonham, 1977, pp. 160 and 162; Newman, 1977, p. 126; Scott, 1979b). The result will be increased costs in numerous categories of expense, which by itself may require more staff (Millett, 1977, pp. 69 and 70; Scott, *ibid.*).

A major influence on this rise in the extent and cost of administration is the tendency toward a centralization of the authority to set objectives and to evaluate efforts. This occurs because questions of survival are *institutional* questions, not individual faculty or department matters alone (Bonham, *ibid.*, p. 165).

In the past, virtually all major changes came about as a result of external and quite unpredictable factors, such as an upsurge in the birth rate; war and postwar economic and political developments; the sudden preoccupation with research in the 1940s; concern about the barriers to educational opportunity; and finally, demands for expanded access in the 1960s (Mayhew, 1977b, pp. 45 and 46). Each of these changes had important effects on the size and complexity, and therefore on the administrative structures of postsecondary institutions. The future holds more of the same.

Recommendations

In *Lords, Squires, and Yeomen* I enumerate sets of recommendations for presidents and collegiate middle managers to follow. Therefore, in this paper I will emphasize only a few ideas. First, since university administration *looks* bureaucratic

*For a thorough discussion of this topic, including comparative salaries, relations with others on campus, and the role of national associations in the professional lives of mid-level administrators, see Scott, 1978.

and therefore encourages the expectation of advancement, and since a basic work motivation in bureaucracies is the opportunity for advancement, frustration results when advancement opportunities are limited. However, according to Cooper, *et al. (op. cit)*, frustration is not as likely to result when the structure of opportunities is known. Colleges and universities should become the pacemakers in developing new models of mobility and advancement. If they are to do this effectively, institutional leaders must be sensitive to their staffs. Workers at all levels, in order to be productive and satisfied, must feel that their jobs are valued, that they can exercise a variety of skills in their work and have responsibility for the results, and that they can see how their work fits into the whole of the operation and will be told how well they are doing (Bess, 1978).

There are many opportunities for self-fulfilling, challenging work if one takes the initiative. If one is a reinsman, alert to new paths and new equipment, uses them wisely in achieving the goals before him or her, and develops the self-confidence needed to deal with the unexpected, job opportunities and satisfactions are possible.

On the trail, the reinsman was his own authority; he made the best judgments he could in the interests of his company, his horses, and his passengers. His reflexes had to be fast and sure. He took advantage of his independence of action. He, and not the robot of narrow view, is a fine model for collegiate administrators to follow.

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